AN EXAMINATION OF THE RELATIONSHIP BETWEEN CLIMATE RESPONSIVE DESIGN STRATEGIES AND THE SENSE OF PLACE;

WITH SPECIAL REFERENCE TO BUILDINGS IN HOT-HUMID CLIMATES.

A Dissertation

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Master of science

in

Architecture

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DECLARATION

I declare that this dissertation represents my own work , except where due acknowledgement is made, and that it has not been previously included in a thesis, dissertation or report submitted to this university or to any other institution for a degree, diploma or other qualification.

Signed: .....

(G.K.D.M.P. Samaratunga)

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CONTENTS

PREFACE:

The inspiration for this dissertation has derived from the five long years of formal architectural education, as well as from informal learning through observation and apprenticeship.

Although this dissertation is written for the final examination leading to the masters degree, it encapsulates my personal philosophy and inclination to architecture, and life in general.

I consider 'survival' to be the ultimate reality in life. In order to survive all forms of life respond to nature and co-exist with it. Responding to environment, especially climate , and preserving the sense of the place are therefore the two most important aspects that is of utmost importance in the field of architecture.

As the well known philosopher, Ravindranath Thargore says , "creativity is in the resolution of contrary forces". Creative and meaningful products of architecture result when contrary forces, whether they be quantitative and qualitative aspects, are harmonized. The ultimate purpose of my endeavor is to show the importance of harmonizing climate responsive strategies which are the quantitative aspects of architecture, along with the qualitative aspect – the sense of place, in order to create meaningful architecture.

Further, it is an attempt to open the doors to reveal another view point to look at architecture. "The sun never knew how wonderful it was" , the architect Louis Kahn said, "until it fell on the wall of a building". Architecture should be perceived and interpreted in that way. Sunlight is intangible, while the wall of a building is tangible. In most cases intangible aspects become more meaningful when they are related or harmonized with tangible aspects. Architecture too would reach its highest goals, if it is in equilibrium with both the tangible and intangible factors of its art.

A greater emphasis has always been laid on the numerical values, statistics and technical methodologies attached to climatology, that are governed and regulated by the laws science. Consequently, the sensory perceptions of climate have been neglected. The spectrum of thermal and visual delight, that is also

consistent with climatic exposure and evident in architectural locations with "a sense of place", needs therefore to be examined more carefully.

There are universally recognized sensations of climate. Therefore this dissertation is written with reference to such universal sensations, with the writer applying them to and evaluating them in local conditions.

The study focuses on the architecture of south and south-east Asia, especially of Sri Lanka with hot – humid climates. Warm climates have a climatic potential beyond that found in more temperate and cool climates. Unlike cool climates, where the sense of enclosure emerges from climatically defensive strategies, tropical buildings open and filter the climate in a multitude of ways. The architectural response to climate, further expands and extends the experience of built fabric. These intangibles aspects of architecture act as contextual palette for aesthetic and creative concepts.

The architecture of the hot-humid region is discussed not as a comprehensive guide, but selectively, so that a sufficient range of buildings which evoke the unique aura of the tropics - buildings which are tangible witnesses to their place and time can be presented to support the arguments of the dissertation. It is hoped that they should act as catalysts to the discovery of the sensitive physicality of the architecture of the region.

Although the theoretical scope of the dissertation is comparably comprehensive, the illustrations and visual statements are necessarily selective and limited, and intended to support the idea rather than for expansive documentation. The medium of photography in particular is a valuable means of strengthening statements and conveying qualitative notions. Paul Goldberger's observation that, *"the photographer's responsibility is to give the building the fairest chance to speak for itself"*, may be aptly quoted.

It is the qualitative aspect of architecture, determined by the essence of a sense of place in architectural fabrics through climate, that remains the principal concern of this dissertation. Architecture of consequence interprets

climate through built-form. It is this means, that students of architecture strive to apply in their comprehensive design projects. The dissertation has been an opportunity to investigate it's theoretical aspects.

excellent

INTRODUCTION

INTRODUCTION:

0.1 THE STUDY:

Architecture is the tangible expression of space, which the human spirit is capable of perceiving . Architecture is more suitable to be understood in terms of ' place' , because architecture is basically 'place making'. Place is the most common form of human experience of his ambient environment . It changes with emotions, time situation, geographical entity, climatic condition people , etc. Therefore ' places' have unique identities or characteristics . the notion of identity or uniqueness is fundamental in everyday life.

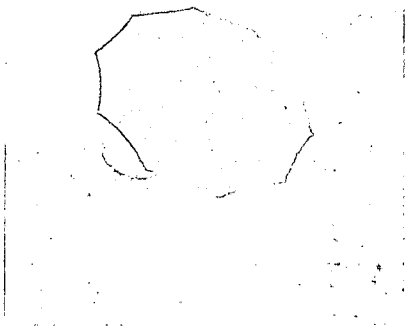
> "... *identity is a basic feature of our experiences of places which both influences and is influenced by those experiences* ..."
>
> Ralph (1975 : 45)

Kevin Lynch (1960 : 6) defines the uniqueness of place simply as that which provides its individuality or distinction from other place and series as the basic for its recognition as a separable entity. This uniqueness of place is important for the existence of all living things. Especially in the context of human beings it is essential because the unique characteristics of a place creates sense of orientation and thus communication. Therefore architects, as makers of places bears the utmost responsibility of protecting the uniqueness of places they create

.

Sense of a place, whether it is built or un-built, is resulted from many unique characteristics of its ambient context, such as the vegetation, the topography, the culture and the economy of its user etc. But it would be correct if said that the climatic factor of that region is the most crucial character that gives the uniqueness or the sense of the place. Therefore the uniqueness of a place has a direct relationship with its climate.

> " *Beauty comes out when the form consider the forces in nature of wind, rain, sun, ...*"
>
> Hassan Fathey.



It is the need for protection from climate that compelled man to build shelter. Since then , his endless thirst for comfort evolved this basic skeleton into new forms thus creating Architecture. Human comfort is identified as physical comfort and psychological comfort. These two are closely linked with each other. Physical comfort facilitates psychological comfort. Therefore achieving physical comfort becomes very important . Physical comfort has a close relationship with climatic response of a built environment which is manifested by climate responsive design strategies. Strategy is the art of planning the way to achieve some thing or to be successful in a particular field. The term strategy is used to mean a list of actions taken by a designer, in order to transform an initial brief into a final design. In any field, not only in architecture, people have advocated strategic methods to achieve best results. Therefore climate responsive design strategies in architecture are list of methods or combination of design decisions that one can intend to use to achieve best results in the field of architecture, of a specific region with a specific climatic condition. The unique climatic conditions and comfort-needs, along with other socio – cultural factors create unique forms and unique places throughout the world.

" *Climate is clearly one of the prime factors in culture, and therefore built form. It is the mainspring for all the sensual qualities that add up to a vital tropical Architecture."*

Tan Hock Beng (1994:13)

Climate is the most important factor that brings unique characteristics to different regions of the planet earth. For example Alaska is different from Africa due to its unique climate. Therefore the Architecture also should be unique in

those unique places which generate sense of place. Climate responsive design strategies should contribute immensely to enhance the unique sense of those places. Therefore the essay would be an attempt to combine the qualitative aspect (uniqueness of place) along with the quantitative aspects (climate responsive strategies)of Architecture.

0.2 IMPORTANCE OF THE STUDY :

The present day context in almost all parts of the world is subjected to a rapid change, posing challenges in all aspects of human life. Sri Lanka offers no exception in this regard. And the population growth and urbanization, etc. have compelled its people to build houses and other buildings on smaller plots of land. Due to aesthetics and great variety of other qualitative and quantitative requirements to be fulfilled in designing the buildings, **climate has been pushed into an unimportant secondary position. In most of the design methodologies used by Architects, the climatic factor is identified as a secondary force or a modifying factor. Climatic factor is so inherent in all aspects of the built environment** that people have taken it for granted. This has resulted in uncomfortable unlivable meaningless, buildings , which in turn have made negative impacts on human behavior.

Climate controls each and every aspect of life. Identity of a society or a culture is determined primarily by climate. For example the rhythm of music used by a culture, which is unique to that culture, has great relationship with the climatic factors such as the sun, rain and wind of that region. If this identity is lost the sense of belonging also will be lost.

Today the world is facing an **energy crisis**. Since the climate responsive design strategies contributes immensely in **energy conservation**, it has captured the attention of many. It is also evident that there is an **emerging design culture which poses on the environmental design of buildings**. The thrust of this design direction is to utilize concepts that minimize environmental impacts of buildings through selecting an appropriate response to the climate.

Climate responsive designs themselves are facing many issues in the present context. For example some designs though they look as if they are climate responsive, they are not. Even the work of the famous architect- Geoffery Bawa, is being criticized under this controversial phenomenon. On the other hand, some designs are actually climate responsive, although they do not look so.

Therefore the chosen study area is critical because the two aspects (Climate and uniqueness of place) discussed in it are crucial to present context of architecture as mentioned above.

Possible causes for the criticality of the study area are as follows:

1. Urbanism, modernism and other present day trends have encouraged mass production of buildings, type planning , etc, which has cause to loose the uniqueness / sense of place in Architecture .

2. Professionals involved in creating the built environment are not aware of the importance of protecting the uniqueness of place to have meaningful and successful environments.

3. Professionals involved in creating the built environment are not aware of the connection between the climate responsive design strategies and the uniqueness of place.

4. Climatic factor is so inherent in all aspects of the built environment that people have taken it for granted.

0.3 INTENTIONS OF THE STUDY

In this study, it is intended to examine the relationship between the climate responsive design strategies used in hot humid climate and the uniqueness of place. And also it is intended to convince that the effective practice of climate responsive architecture lies in the generation and evaluation of strategies applicable to the particular building context.

Since the uniqueness of place and climate responsive building designs are two of the most important issues in the present architectural field, this study would enable one to understand their importance and incorporate them in making meaningful and successful building designs in the built environment.

0.4 SCOPE AND LIMITATONS

Very little work has been done from the point of view adopted here, and this study

must be exploratory. No essay or book on such a vast subject can be final- and this one, in fact, represent a generally accepted or shared body of thought. Many of the conclusions will, no doubt, have to be elaborated and revised in the future.

And also due to the limitation of time and resources the study would focus only on the hot humid climates.

According to Christopher Day(1990:46)," To create nice and more importantly, meaningful, appropriate atmospheres, we need to focus our attention not on the quantities but on the qualities." Likewise, in this essay I have chosen a qualitative approach(using the writer/my self as the indicator/meter), rather than evaluating climatic impact by means of a set of numerical values.

The photographic medium is primarily used to strengthen the statements made . However, this medium is not totally successful in capturing the spatial quality and time because space is always experienced as a totality. Egyptian architect Hassan Fathy once defined architecture as, " the space between the walls and not the walls". The photographic image can only capture the walls.

0.5 METHOD OF STUDY

The methodology adapted to establish the above mentioned intension of the study, is a case study method. This method is chosen above the other methods such as the comparative analysis approach, the participatory observation method, etc. is because it would be based primarily on personal observation of the selected built environments and the related literature survey. These selected built environments will be from places which are outstandingly unique. The conclusions drawn would be mainly through observations, where an attempt would be made to recognize a certain pattern based on literature survey.

The study would be in three phases. At the first phase, the relationship between climate, comfort & architecture will be discussed. After discussing the climate, in general, along with global & local climatic zones, climate responsive designs, especially in hot humid climates will be discussed in depth.

Then the notion of comfort will be studied in terms of thermal comfort, visual comfort, etc. and would derive a link between climate, comfort and the sense of place in architecture.

The second phase would start by discussing the sense of place in general. This would give a prelude to 'place'-the fundamental phenomenon of architecture and would discuss the importance of protecting the uniqueness of a place in architectural place making. The latter part of that phase would talk of sense of place in response to climate. The third phase would focus on the contribution of climate responsive design strategies in enhancing the uniqueness of a place. Local and international examples would be given. Case studies would be given to strengthen the statement.

The study would conclude by suggesting possible climate responsive design resolutions that would enhance the uniqueness of place. Conclusions would be drawn upon based on the understanding & analyzing of the case studies. To strengthen these conclusions existing examples for each of those building types would be discussed.

The conclusion would summaries the study and propose areas with potentials for further research and study.

There is a critical observation and a research gap identified with regard to the above mentioned study area. Since the method of the study and the scope & limitations of the study are rationalized accordingly, this study has a possibility of obtaining the formulated statement.

In the end of this study, it is hoped that the issues discussed will inspire & encourage responsible environmental design practice and thus minimize negative building impacts for users and the broader environment.